

## Two New Species of *Pseudoyelicones* (Braconidae: Rogadinae) from Costa Rica

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*Abstract.*—Two new species of the braconid wasp genus *Pseudoyelicones* van Achterberg, Penteado-Dias and Quicke from Costa Rica are described and illustrated, *P. limonensis* sp.n. and *P. rojasi* sp.n., bringing the total number of species of *Pseudoyelicones* known to five, four of which are recorded from Costa Rica. Additionally, six more specimens of *P. nigriscutum* van Achterberg and Quicke are recorded. A modification to the key of van Achterberg, Penteado-Dias and Quicke (1997: Zoologische Mededeelingen. Leiden 71: 1–8) is included to differentiate *P. limonensis* sp.n. and *P. rojasi* sp.n. from similar species.

*Key words.*—Braconidae, Rogadinae, *Pseudoyelicones*, *Yelicones*, new species.

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van Achterberg, Penteado-Dias and Quicke (1997) described the genus *Pseudoyelicones* to accommodate three highly aberrant species of rogadine parasitic wasps from Brazil and Costa Rica. *Pseudoyelicones* species superficially look very similar to those of a highly distinctly braconid wasp genus *Yelicones* Cameron in that they are robust wasps with swollen femora, shortened medial tarsal segments, laterally compressed hind basitarsus, a strongly slanted labrum, and have a large triangular basal area on the second metasomal tergite (van Achterberg, Penteado-Dias and Quicke 1997). However it can be distinguished easily from *Yelicones* by the strongly curved hind wing vein SR which lies within a highly corrugated area of the wing membrane. In addition, its mandible is distinctly bidentate rather than tridentate, the precoxal suture and occipital carina are absent, the tarsal claws are not pectinate, the telotarsi hardly or not enlarged, fore wing vein M+CU is straight apically, hind wing vein 1r-m is vertical,

vein 2-SC+R is vertical and widened and vein m-cu is very short or indistinct.

*Yelicones* is cosmopolitan and available host records suggest that they are solitary endoparasitoids of various pyralid moth larvae (Quicke and Krufft 1995; Areekul and Quicke submitted). In contrast, *Pseudoyelicones* is known only from the Neotropical region to date. Its biology is unknown, although all Rogadinae *sensu stricto* (ie. Rogadini of many authors) are koinobiont endoparasitoids of Lepidoptera larvae whose remains they mummify before pupating within the host (Shaw and Huddleston 1991). The large eyes and ocelli of *Pseudoyelicones* species, and their yellow or brownish yellow colour, suggest that they are probably nocturnal, as are many *Yelicones* species and most other Rogadinae (Gauld and Huddleston 1976; Quicke, Austin and Chishti 1998).

Here we describe two new species discovered recently in the collection of INBio, Costa Rica, originally misidentified as *Yelicones* species. Although all known species

of *Pseudoyelicones* are morphologically very similar, the new species indicate that some details of sculpture may be of taxonomic use in the genus, in addition to colour and size. Six additional specimens of *P. nigricutum* van Achterberg were located in the INBio collection, all from the same locality, Province Punta, as the holotype.

#### MATERIALS AND TERMINOLOGY

Material was sorted from the collection of the Instituto Nacional de Biodiversidad (INBio), Santo Domingo de Heredia, Costa Rica. A middle leg from one side of the body was removed from a paratype specimen of *P. limonensis* sp.n. and *P. nigricutum* for DNA sequencing. The specimens were then photographed using Automontage®. Terminology largely follows that of van Achterberg (1979, 1988). Description of sculpture follows Harris (1979).

#### SYSTEMATICS

Genus *Pseudoyelicones* van Achterberg, Pentead-Dias and Quicke, 1997

Type species, *Pseudoyelicones manoeli* van Achterberg and Pentead-Dias by original designation.

#### DESCRIPTIONS

##### *Pseudoyelicones limonensis* sp.n.

(Figs 1–6)

*Material*.—Holotype female, "Cerro Tortuguero, P.N. Tortuguero, 0–100m. Prov. Limon, COSTA RICA. J. Solano, Mar 1991. L<sub>N</sub>-285000, 588000", "COSTA RICA INBIO CRI000 317905" (INBC). Paratype, female, "Amubri 70m, Talamanca Prov. Limon, Costa Rica, 12 a 30 set. 1992. G. Gallardo L<sub>S</sub> 385500, 578050", "COSTA RICA INBIO CRI000 960331" (INBC).

Holotype, length of body 8.5 mm, of fore wing 7.0 mm.

*Head*.—Antennae with 52 flagellomeres; terminal flagellomere acuminate, approximately 3.0 times longer than wide; length of third flagellomere as long as fourth;

length of third, fourth and penultimate flagellomeres 0.6, 0.6 and 1.7 times their widths, respectively; malar space with moderately dense, long setosity; height of clypeus: inter-tentorial distance: tentorio-ocular distance = 1.3:4.8:1.0; face transversely carinate with sparse long setosity (Figs. 1, 2); height of eye: width of face: width of head = 1.6:1.0:2.3; width of hypopyeal depression 0.5 times minimal width of face; length of malar space 0.4 times basal width of mandible; eye glabrous; length of eye in dorsal view 2.6 times temple (Fig. 3); occiput and temple smooth; post-ocellar length: transverse diameter of posterior ocellus: shortest distance between posterior ocellus and eye = 1.0:2.0:1.0.

*Mesosoma*.—Smooth, moderately densely setose, 1.6 times longer than high; mesoscutum distinctly higher than pronotum anteriorly; notauli deep, weakly crenulated, impressed on anterior half of mesoscutum; scutellus sulcus with 3 carinae between the two outer ones; median area of metanotum keel; scutellum largely smooth, weakly striate posteriorly, postero-medially with distinct carina; mesopleuron shiny and smooth (Fig. 4); propodeum with distinct median carina, finely granulate, posterior half transversely carinate (Fig. 5).

*Wings*.—Fore wing: lengths of veins SR1: 3-SR: r = 1.0:4.8:2.5; vein 1-SR+M straight; vein r arising 0.5 distance from base of pterostigma; lengths of veins 2-SR: 3-SR: r-m = 1.1:1.9:1.0; lengths of veins 2-SR+m: 2-M: m-cu = 1.0:2.3:1.0; lengths of veins 2-CU1: 1-CU1 = 4.0:1.0; lengths of veins 2-CU1: 3-CU1 = 4.0:1.0; veins C+SC+R and 1-SR forming an angle of 45°. Hind wing: vein cu-a unsclerotised; vein m-cu indistinct; basal cell, subbasal cell and basal parts of marginal and submarginal cells glabrous (Fig. 6).

*Legs*.—Lengths of fore femur: tibia: tarsus = 1.1:1.3:1.0; length of fore femur 2.3 times longer than deep; fore tibia with distinct longitudinal ridge; hind femur 2.3

times longer than deep; lengths of hind femur: tibia: basitarsus = 1.7:2.3:1.0; hind basitarsus 3.1 times longer than deep; length of hind tibial spurs 0.5 and 0.6 times hind basitarsus.

*Metasoma*.—Shiny and sparsely setose; first tergite with anterior 0.6 weakly striate, dorsal carinae uniting before the level of spiracles, with distinct, nearly complete median carina; second tergite smooth, antero-medially with smooth triangular area produced posteriorly to form incomplete medial carina; second suture smooth, indistinct; tergites 3–7 smooth; length of ovipositor sheath 0.05 times fore wing.

*Colour*.—Yellow; antennae basally brownish yellow with apical 17 flagellomeres somewhat darker brown; stemmaticum dark brown; ovipositor sheath brown; wing membrane very pale yellow; wing veins brownish yellow except veins apical 0.7 of 1SR+M, m+cu, 3-CU1 and CU1a, brown.

*Etymology*.—Named after type locality, Limon Province.

*Comments*.—This species is similar to *P. manoeli* van Achterberg and Penteado Dias but can be easily separated by the apical segment of the antennae which is brown rather than ivory and by the propodeum which has distinct transverse carinae posteriorly (Fig. 5).

*Pseudoyelicones rojasi* sp.n.  
(Figures 7–12)

*Material*.—Holotype, female, "Sector Cerro Cocori, Fca. De E. Rojas, 150m, Prov. Limon, Costa Rica, E. Rojas, 28 may a 17 jun 1992, L<sub>N</sub> 286000, 567500", "COSTA RICA INBIO CRI000 764364" (INBC). Holotype, length of body 7.0 mm, of fore wing 5.0 mm.

*Head*.—Antennae with 42 flagellomeres; terminal flagellomere acuminate, approximately 2.5 times longer than wide; third flagellomere 1.1 times length of fourth; length of third, fourth and penultimate flagellomeres 0.9, 0.9 and 1.6 times their widths, respectively; malar space moder-

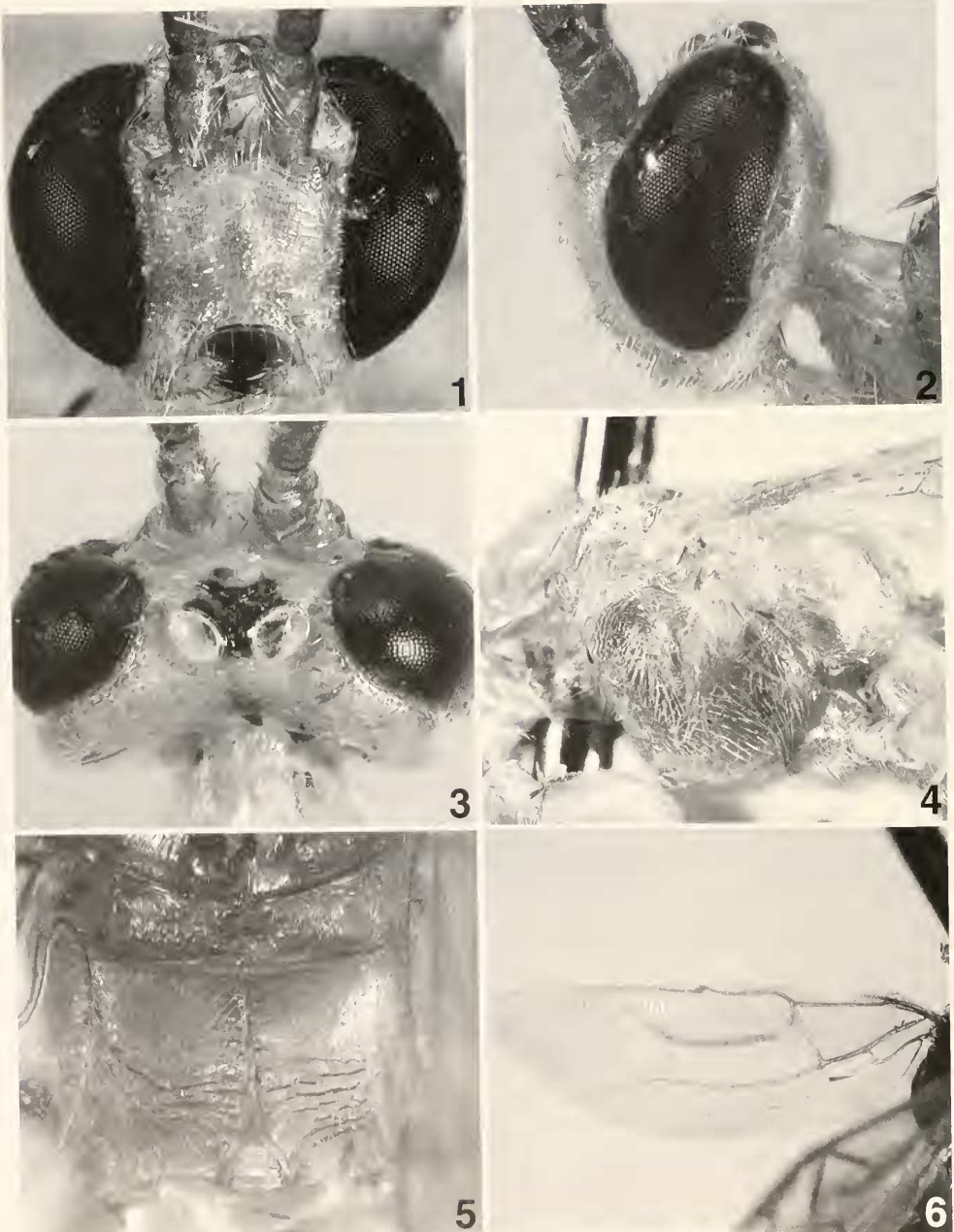
ately long setose; height of clypeus: intertentorial distance: tentorio-ocular distance = 1.3:4.4:1.0; face transversely carinate with moderately sparse long setosity (Fig. 7); height of eye: width of face: width of head = 1.4:1.0:2.2; width of hypoclypeal depression 0.5 times minimal width of face; length of malar space 0.5 times basal width of mandible; eye glabrous; length of eye in dorsal view 3.1 times temple (Fig. 8); occiput and temple smooth; post-ocular length: transverse diameter of posterior ocellus: shortest distance between posterior ocellus and eye = 1.0:2.5:1.0.

*Mesosoma*.—Smooth, shiny, moderately densely setose, 1.8 times longer than high; mesoscutum distinctly higher than pronotum anteriorly, postero-medially coarsely striate; notauli deep, smooth, impressed on anterior half of mesoscutum; scutellus sulcus with 5 carinae between the two outer ones; medial area of metanotum with keel; scutellum completely finely longitudinally striate (Fig. 9), postero-medially with distinct carina; mesopleuron largely smooth (Fig. 10); propodeum with distinct median carina, finely granulate anteriorly, with weak, irregular transverse carinae posteriorly (Fig. 11).

*Wings*.—Fore wing: lengths of veins SR1: 3-SR: r = 1.0:8.4:4.4; vein 1-SR+M straight; vein r arising half way along pterostigma; lengths of veins 2-SR: 3-SR: r-m = 1.0:1.9:1.1; lengths of veins 2-SR+M: 2-M: m-cu = 1.0:4.0:1.5; lengths of veins 2-CU1: 1-CU1 = 4.0:1.0; lengths of vein 2-CU1: 3-CU1 = 2.5:1.0; veins C+SC+R and 1-SR forming an angle of 30°. Hind wing: both destroyed.

*Legs*.—Lengths of fore femur: tibia: tarsus = 1.4:1.7:1.0; length of fore femur 2.4 times longer than deep; fore tibia with distinct longitudinal ridge; hind femur 2.4 times longer than deep; lengths of hind femur: tibia: hind basitarsus = 1.5:1.9:1.0; hind basitarsus 4.0 times longer than deep; length of hind tibial spurs 0.4 and 0.5 times hind basitarsus.

*Metasoma*.—Moderately sparsely setose;



Figs. 1-6. *P. limonensis* sp.n. 1, frontal view of face; 2, lateral view of head; 3, dorsal view of head; 4, lateral view of mesosoma; 5, dorsal view of propodeum; 6, hind wing.

anterior 0.6 of first tergite weakly striate, 1.2 times wider than medially long, dorsal carinae uniting before the level of spiracles, with distinct, nearly complete medial

carina (Fig. 12); second tergite largely smooth, 1.9 times wider than medially long, antero-medially with smooth triangular area produced posteriorly to form

incomplete medial carina (Fig. 12); second suture distinct laterally, indistinct medially, smooth; third tergite smooth, 2.4 times wider than medially long; tergites 4–7 smooth; length of ovipositor sheath 0.06 times fore wing.

*Colour*.—Largely pale yellow; antennae basally yellow, distally 10 flagellomeres brown except apical flagellomere very pale yellow; head, metasomal tergites 1–3, brownish yellow; stemmaticum, tegula, scutellum except disc, metanotum, pterostigma, legs, apical 0.2, 0.3 and 0.3 of

fore, mid and hind femora, fore, mid and hind tibiae, dark brown; metasomal tergites 4–7, mesopleuron antero-dorsally, ovipositor sheath and ovipositor, brown; wings veins yellow except for veins 1-SR+M, 2-CU1, 3-CU1, m-cu and CU1a brownish yellow, membrane very pale yellow except for first discal cell entirely and second discal cell basally, very pale brown.

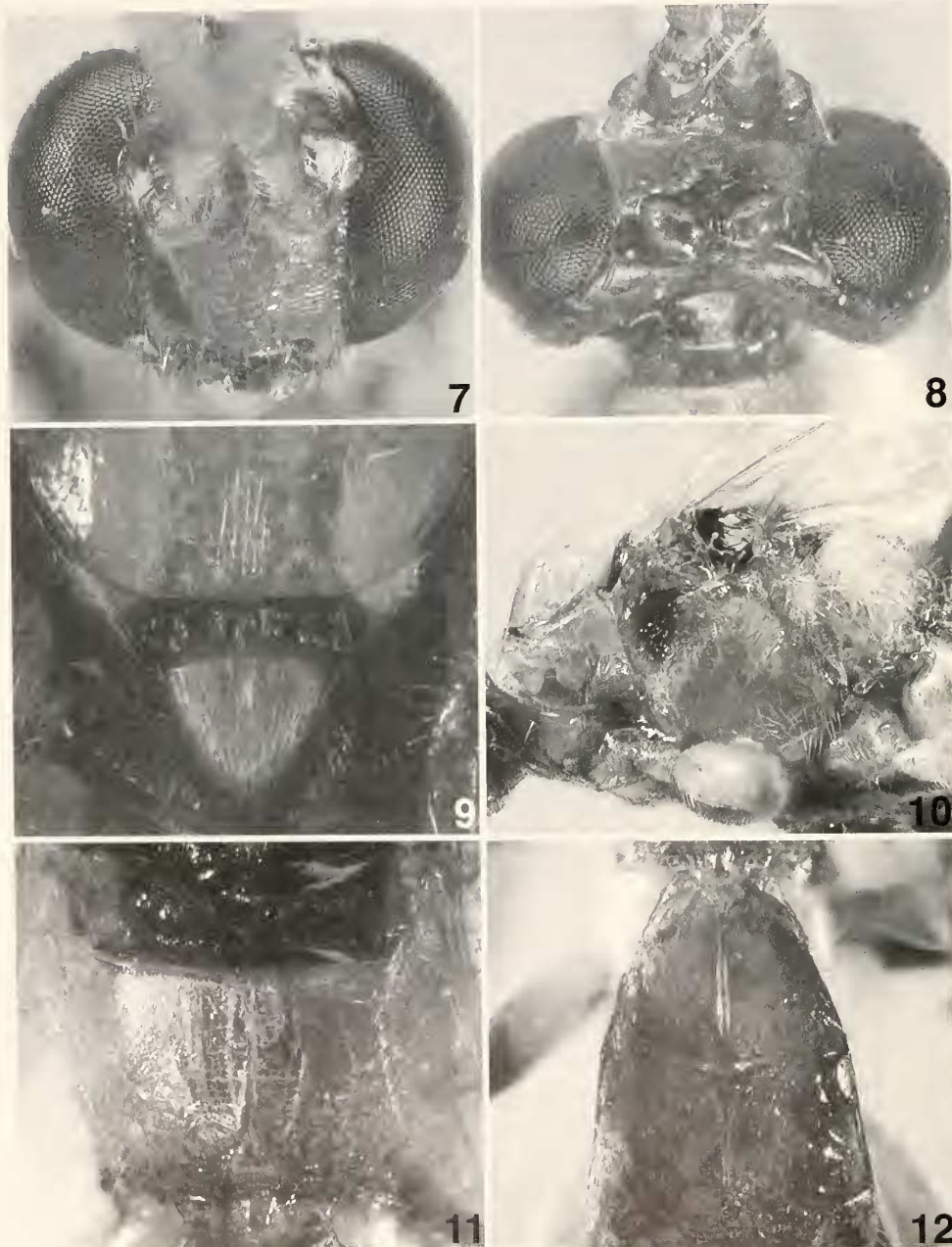
*Etymology*.—Named after its collector.

*Comments*.—This is a distinctive species because of its scutellum which is completely striate (Fig. 9).

#### KEY TO *PSEUDOYELICONES* SPECIES

The following is a modified version of the key to *Pseudoyelicones* species by van Achterberg, Pentead-Dias and Quicke (1997) accommodating the new species described here.

1. Mesoscutum and scutellum completely black or dark brown; apex of hind tibia yellow, contrasting with dark brown remainder of tibia; area below pterostigma distinctly darkened and contrasting with sub-hyaline apex of fore wing ..... *P. nigriscutum* van Achterberg
- Mesoscutum and scutellum not as above (Fig. 9); colour of apex of hind tibia not as above; area below pterostigma slightly darkened and not or hardly contrasting with apex of fore wing ..... 2
- 2(1) Pterostigma (except narrowly at base and at apex), mesopleuron antero-dorsally, middle and hind tibiae and apices of femora dark brown (Fig. 10); length of fore wing 3–5 mm ..... 3
- Pterostigma, mesopleuron antero-dorsally, middle and hind tibiae and apices of femora brownish-yellow (Fig. 4); length of fore wing about 8 mm ..... 4
- 3(2) Scutellum distinctly finely striate (Fig. 9); mesoscutum postero-medially with large area of finely striae (Fig. 9); mesoscutum completely yellow; scutellum yellow except posteriorly dark brown (Fig. 9); basal 3 metasomal tergites completely brown (Fig. 12); fore wing vein 1-CU1 yellow ..... *P. rojasi* sp.n.
- Scutellum smooth, without striae; mesoscutum postero-medially with narrow area of fine striae; mesoscutum brownish yellow except laterally dark brown; scutellum dark brown except for medially paler; 1st and 2nd metasomal tergites brownish yellow except for first tergite postero-medially, second tergite medially and posteriorly dark brown, third tergite largely dark brown; fore wing vein 1-CU1 dark brown ..... *P. phacostigma* van Achterberg and Quicke
- 4(2) Apical segment of antennae ivory; propodeum densely rugulose, without distinct transverse carinae posteriorly; wing veins brownish yellow except for veins r, 3-SR, 2-SR, 1-SR+M, 2-M, m-cu and 3M dark brown ..... *P. manoeli* van Achterberg and Pentead-Dias
- Apical segment of antennae brown; propodeum with microsculpture anteriorly, posteriorly with distinct transverse carinae (Fig. 5); wing veins yellow except fore wing veins 1-SR+M, m-cu, 3-CU1 and CU1a dark brown ..... *P. limonensis* sp.n.



Figs. 7-12. *P. rojasi* sp.n. 7, fronto-dorsal view of face; 8, dorsal view of head; 9, dorsal view of posterior part of mesoscutum and scutellum showing fine longitudinal striation of the latter; 10, lateral view of mesosoma; 11, dorsal view of propodeum; 12, dorsal view of first and second metasomal tergites.

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